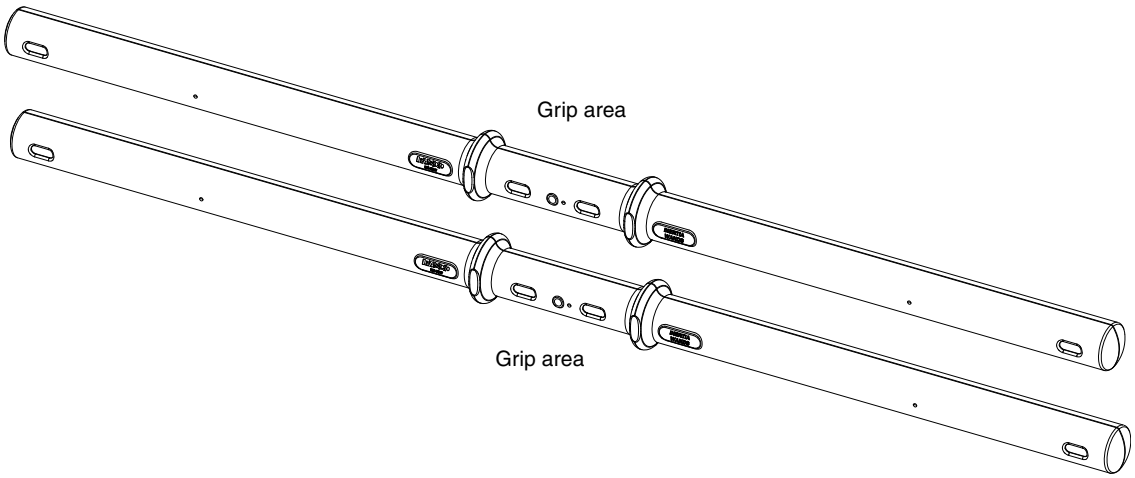
PASCO Rotational Inertia Wands

ME-9847



Included Equipment

Rotational Inertia Wand, Blue
Rotational Inertia Wand, Red

Introduction

The ME-9847 PASCO Rotational Inertia Wands are designed to show how the distribution of mass in an object determines the object's rotationa inertia (moment of inertia). The blue inertia wand has masses installed at both ends of the tube. The red inertia wand has masses installed near the grip at the center of the wand. Both wands have the same amount of mass, so they weigh the same and "feel" equally heavy when lifted.

Theory

Objects that can rotate have a tendency to resist any change in their rotation. If they are at rest, they tend to stay at rest. If they are in motion (rotating), they tend to stay in motion. This tendency is called *rotational inertia* (or moment of inertia). If a net torque (twisting force) is applied to an object that can rotate, it will change the rotation of the object. The amount of change in the rotation (called the angular acceleration, α) is directly proportional to the net torque, τ, and inversely proportional to the rotational inertia, I.

$$\alpha = \frac{\tau}{I}$$

The rotational inertia depends on the amount of mass in the object and the distribution of mass. If the mass of an object is close to its center of rotation, the rotational inertia will be smaller. It will be 'easier' to start rotating and stop rotating the object. If the mass is distributed far away from the object's center of rotation, the rotational inertia will be larger. It will be 'harder' to start rotating and stop rotating the object.

Operation

1. Grasp the grip area of one of the rotational inertia wands. Hold the wand so that it is vertical or horizontal.

2. Twist your wrist to rotate the wand back and forth. Make a note of how hard or how easy it is to rotate the wand.

3. Repeat with the other wand. Again make a note of how hard or how easy it is to rotate the wand.

How does the blue wand (with the masses farther from the grip area) compare to the red wand (with the masses nearer the grip area of the wand)?

Technical Support

For assistance with any PASCO product, contact PASCO at:

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Web: www.pasco.com

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Limited Warranty
For a description of the product warranty, see the PASCO catalog.

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